Appendix E

DLAST Methodology and Preliminary Results

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Appendix E. DLAST Methodology and Preliminary Results

E.1 DLAST Methodology

One of the primary objectives of the needs assessment process was to determine the extent of the cross-cutting education and training needs within the Department that could possibly be met using advanced training technologies. The Distance Learning Appropriateness Screening Tool (DLAST) was developed to estimate training needs, and to predict the effectiveness and applicability of the various types of advanced training technologies for delivering cross-cutting learning activities.

Two types of data about education and training were identified as vital to the needs assessment: demographics (e.g., information regarding the size, distribution across the complex, and nature of the intended audience for each projected need); and internal course attributes (e.g., type of learning and testing required, amount of media and hands-on experience required, amount of interactivity and individualization required, and risk if training was inadequate). The processes used to collect and analyze the data and an overview of the results are described in the following sections.

E.1.1 Demographic Data

Data was collected (from sources such as the Departmental Training Information System) regarding the following course demographic information: course length; the percentage of DOE Federal and contractor employees who need to take the course at some point in their careers; whether the course was an initial training or required annual, bi-annual, or tri-annual refreshing; and the percentage of students having to travel to attend the course. This information was entered into the DLAST and used to calculate preliminary data about Departmental needs in the areas of student training hours delivered/required, distribution of training needs across the Department, and levels of travel related to training.

Statistics were collected (from sources such as course catalogs) regarding the quantity and type of education and training currently being provided throughout the DOE complex. The DOE Universal Catalog was the primary source of information. The DOE Universal Catalog organizes course descriptions into 13 topical areas. Approximately 1,600 course descriptions were available. An analysis of the 13 topical areas resulted in the identification of seven areas where cross-cutting potential was most likely to occur. Six representative courses were selected from each of the seven topical areas. Several hundred additional course descriptions were randomly selected with no particular quantity being drawn from any one source or topical area.

During the second business case workshop, the participants reviewed 164 course descriptions (approximately 10 percent of the total courses found including duplicate courses) and sorted the courses into high-level categories of cross-cutting potential. Each course was rated as one of three levels: (A) training required for essentially all personnel, (B) training required for all employees who share a given job type or work function, and (C) training required for all

employees working at a particular type of facility. Training required for all personnel (level A) has the greatest potential for cross-cutting applicability.

Table E-1 at the end of this section offers a summary of the analysis of courses using the 13 topical areas from the DOE Universal Catalog. The table presents the number of courses selected (rated) in each area, the number of courses that were not rated, and the total number of course descriptions that were found for each topical area.

The table also provides the percentage of courses rated in each topical area based on the number of courses found, an estimated percentage of the total number of courses represented in a topical area, and an estimate of the maximum number of unique courses that exist for each topical area. The maximum number of unique courses in several cases was estimated to be less than the number found because of observed or suspected duplication. For example, of the 267 professional development courses found, only 133 represented unique courses. In other areas, it is assumed that there are significantly more courses being offered than were found (e.g., Engineering Sciences where only 10 courses were found, but three times that number are believed to exist.)

E.1.2 Course Characteristics Data

The 164 courses analyzed for demographic data were also subjected to a rating of the characteristics of the courses to determine their appropriateness for technology-supported learning. The following characteristics were used for the rating.

- Stability of the course content
- Learning outcomes to be achieved
- Amount of media required (i.e., audio, still graphics, full motion video, animation, etc.)
- Overall quality or fidelity level for the required media elements
- Amount of interactivity between students and with the instructor
- Amount of individualization needed in terms of feedback and branching through the course (as well as site specific content)
- Type of testing to be performed to confirm student comprehension
- Risks involved if the students did not fully learn the course content

A 10-point sliding scale was used to rate six of the characteristics, where a rating of 1 indicated a low need or weak relationship and 10 indicated a high need or strong relationship. The learning outcomes characteristic used an eight-level scale representing learning types with psychomotor at the low end and evaluation at the high end. The type of testing characteristic used a six-level scale ranging from recognition on the low end to performance on the high end.

E.2 DLAST Results

Using the estimates collected for both types of data (demographics and course characteristics), DLAST was designed to calculate, at a preliminary screening level, the relative appropriateness of each of the three major advanced training technologies (interactive television, multimedia, and Internet) for delivering cross-cutting courses. Weighted tables were developed that took the

course characteristic data and added to or subtracted from a score based for each media type. Depending on the three calculations, each media type was considered Excellent, Good, or Poor for each course.

Using these qualitative screening assessments, DLAST then made five preliminary recommendations for each course based on rules programmed in for five alternative scenarios for delivering courses. The first three scenarios included both Excellent and Good rated courses. The first scenario maximized the use of interactive television, the second maximized the use of multimedia, and the third maximized the use of high-speed networks. The final two scenarios considered only Excellent ratings. The fourth scenario maximized for interactive television, while the fifth maximized for multimedia. The tool was built such that other scenarios, adjustments, and variations could be configured through programming.

Tables E-2, E-3, and E-4 at the end of this section provide a summary of the DLAST results for each of the advanced training technology focuses (interactive television, multimedia, and Internet) and show which delivery method was rated Excellent, Good, or Poor for each DOE Universal Catalog topical area.

The DLAST results were preliminary in nature and were treated as projective rather than actual or definitive. DLAST was used to develop an overall picture of the education and training needs that might be addressed by technology-supported learning--especially estimates of the numbers of cross-cutting courses that might be delivered appropriately through each of the advanced training technologies. The results of the analysis provided a reasonable basis for creating alternatives that could be analyzed for costs and benefits.

DLAST was not used to make decisions about which courses should be converted to a technology-supported learning delivery method, or which method or combination of methods would be most appropriate. For each course being considered for technology-supported learning delivery, a detailed media/method selection analysis should be performed at the course objective level. Such analysis was found to be necessary by several organizations surveyed in the Benchmarking and Best Practices efforts. This analysis is also called for in the Systematic Approach to Training.

Table E-1. Summary of DLAST Demographic Data

DOE Universal Catalog Categories	Number of Courses in Each Category Rated Using DLAST	Number of Courses in Each Category Not Rated	Total Number of Courses Found	Percentage Rated of Courses Found	Estimated % of Courses Found From Total Courses Available (rated + not rated)*	Estimated Number of Unique Courses Available in Each Category
Administration, Orientation, & Awareness (ADM)	20	135	155	13%	100%	155
Engineering Sciences (ENG)	9	1	10	90%	30%	33
Environmental (ENV)	22	32	54	41%	80%	68
Management (MGT)	23	123	146	16%	100%	146
Nuclear Theory Processes & Systems (NTP)	3	1	4	75%	10%	40
Nuclear Safety (NUS)	8	1	9	89%	10%	90
Nuclear Weapons (NUW)	2	1	3	67%	10%	30
Oversight (OVR)	16	303	319	5%	500%	64
Professional Development (PRO)	15	252	267	6%	200%	133
Physical Sciences & Mathematics (PSM)	4	1	5	80%	5%	100
Safeguards & Security (S&S)	19	200	219	9%	100%	219
Safety & Health (SAF)	18	392	410	4%	400%	102
Technology Transfer (TTR)	5	1	6	83%	100%	6
Total Crosscutting Courses			1,607			1186

*Percentages greater than 100 indicate the existence of duplicate courses.

Table E-2. DLAST Results With Focus on Interactive Television (ITV)

Topic	No. Rated	Excellent	% Excellent	Good	% Good	Poor	% Poor
ADM	20	7	35%	11	55%	2	10%
ENG	9	4	44%	5	56%	0	0%
ENV	22	14	64%	6	27%	2	9%
MGT	23	11	48%	12	52%	0	0%
NTP	3	0	0%	2	67%	1	33%
NUS	8	0	0%	5	63%	3	38%
NUW	2	2	100%	0	0%	0	0%
OVR	16	6	38%	10	63%	0	0%
PRO	15	5	33%	4	27%	6	40%
PSM	4	4	100%	0	0%	0	0%
S&S	19	8	42%	9	47%	2	11%
SAF	18	12	67%	6	33%	0	0%
TTR	5	4	80%	1	20%	0	0%
Total	164	77	47%	71	43%	16	10%

Alt 1	148	90%
Alt 2	0	0%
Alt 3	3	2%
Alt 4	77	47%
Alt 5	4	2%

Alt 1 Do as much as possible (excellent and good) via ITV, then MM and Net
Alt 2 Do as much as possible (excellent and good) via MM, then Net and ITV
Alt 3 Do as much as possible (excellent and good) via Net, then MM and ITV
Alt 4 Do excellent only, start with ITV, then MM, and finally Net
Alt 5 Do excellent only, start with MM, then Net, and finally ITV

Table E-3. DLAST Results With Focus on Multimedia

Topic	No. Rated	Excellent	% Excellent	Good	% Good	Poor	% Poor
ADM	20	10	50%	9	45%	1	5%
ENG	9	9	100%	0	0%	0	0%
ENV	22	18	82%	3	14%	1	5%
MGT	23	15	65%	8	35%	0	0%
NTP	3	2	67%	1	33%	0	0%
NUS	8	5	63%	3	38%	0	0%
NUW	2	2	100%	0	0%	0	0%
OVR	16	11	69%	5	31%	0	0%
PRO	15	5	33%	7	47%	3	20%
PSM	4	4	100%	0	0%	0	0%
S&S	19	14	74%	5	26%	0	0%
SAF	18	16	89%	2	11%	0	0%
TTR	5	5	100%	0	0%	0	0%
Total	164	116	71%	43	26%	5	3%

Alt 1	11	7%
Alt 2	159	97%
Alt 3	102	62%
Alt 4	43	26%
Alt 5	116	71%

Alt 1 Do as much as possible (excellent and good) via ITV, then MM and Net
Alt 2 Do as much as possible (excellent and good) via MM, then Net and ITV
Alt 3 Do as much as possible (excellent and good) via Net, then MM and ITV
Alt 4 Do excellent only, start with ITV, then MM, and finally Net
Alt 5 Do excellent only, start with MM, then Net, and finally ITV

Table E-4. DLAST Results With Focus on Internet/High-Speed Networks

Topic	No. Rated	Excellent	% Excellent	Good	% Good	Poor	% Poor
ADM	20	3	15%	3	15%	14	70%
ENG	9	0	0%	4	44%	5	56%
ENV	22	8	36%	3	14%	11	50%
MGT	23	1	4%	4	17%	18	78%
NTP	3	0	0%	0	0%	3	100%
NUS	8	0	0%	0	0%	8	100%
NUW	2	0	0%	1	50%	1	50%
OVR	16	1	6%	3	19%	12	75%
PRO	15	1	7%	1	7%	13	87%
PSM	4	0	0%	4	100%	0	0%
S&S	19	1	5%	4	21%	14	74%
SAF	18	3	17%	6	33%	9	50%
TTR	5	1	20%	2	40%	2	40%
Total	164	19	12%	35	21%	110	67%

Alt 1	0	0%
Alt 2	0	0%
Alt 3	54	33%
Alt 4	0	0%
Alt 5	0	0%

Alt 1 Do as much as possible (excellent and good) via ITV, then MM and Net
Alt 2 Do as much as possible (excellent and good) via MM, then Net and ITV
Alt 3 Do as much as possible (excellent and good) via Net, then MM and ITV
Alt 4 Do excellent only, start with ITV, then MM, and finally Net
Alt 5 Do excellent only, start with MM, then Net, and finally ITV

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